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**United States Patent** [19]

Biegelsen et al.

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[54] **DISPLAY SHEET WITH A PLURALITY OF  
HOURLASS SHAPED CAPSULES  
CONTAINING MARKING MEANS  
RESPONSIVE TO EXTERNAL FIELDS**

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[52] **U.S. Cl.** ..... 313/483; 313/493; 313/634

[58] **Field of Search** ..... 313/358, 483,  
313/493, 634; 359/247

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[57] **ABSTRACT**

An external field activated display sheet is disclosed which comprises a plurality of hourglass shaped capsules for each pixel of an image. Each hourglass shaped capsule contains ink in one of its chambers. The ink in each hourglass shaped capsule is responsive to an external field being applied across the capsule for the movement from one chamber to the other. An opaque medial sheet blocks the visibility of the ink in the chambers under the medial sheet. Applying an external field across an hourglass shaped capsule causes the ink to be moved into the chamber above the medial sheet where it is visible. By applying an external field across selective hourglass shaped cavities, an image can be displayed.

**34 Claims, 7 Drawing Sheets**

